

FIRST DISCOVERY OF BITTACIDAE (MECOPTERA) IN HAINAN ISLAND, CHINA, WITH DESCRIPTION OF A NEW SPECIES¹

Jiang-li Tan² and Bao-zhen Hua²

ABSTRACT: *Bittacus hainanicus*, sp. nov., the first hangingfly species discovered from Hainan Island, south China, is described as new to science. Its wing venations and genitaliae are also illustrated.

KEY WORDS: Mecoptera, Bittacidae, *Bittacus*, Hainan Island, China

Bittacus Latreille, 1805, the largest and cosmopolitan genus in the family Bittacidae, is the only hangingfly genus distributed in China. To date, 26 species of *Bittacus* have been reported from China (Cheng, 1957; Penny and Byers, 1979; Hua and Chou, 1998; Huang and Hua, 2005; Cai et al., 2006; Hua and Tan, 2007). No species, however, has been reported from the tropical Hainan Island, which is the second largest island in China and located in the South China Sea. During a recent entomological expedition in Hainan Island, four specimens of hanging-flies (Bittacidae) were collected and found to be a new species. It is also the first Bittacidae discovered from Hainan Island.

Bittacus hainanicus Tan et Hua, NEW SPECIES (Figures 1-10)

Diagnosis. The new species is very peculiar for its complexity of genital structure, hard to find close relatives among its congeners. On wing patterns it slightly resembles *Bittacus flavidus* Huang et Hua, 2005, from Shaanxi, but can be separated from the latter by one pterostigmal cross-vein (Pcv). As for the male epiandrial appendages, it somewhat resembles *Bittacus appendiculatus* Esben-Petersen, 1927, from Yunnan, China, but can be differentiated by two ventral processes.

Description (based on one male and three female specimens, preserved in 70% alcohol). *Head:* Vertex, occiput and frons amber-brown; rostrum and maxillary palps dark brown; eyes black; ocellar triangle black. Antenna brown with 19 flagellomeres hairy.

Thorax: Pronotum unevenly dark brown, without distinct setae; anterior two-third of mesonotum nearly black with a pale brown median streak, the remaining part and metanotum yellowish brown. Pleura unevenly darkish to yellowish brown. A few short black setae present on the yellowish brown femora, tibiae and tarsi; femur blackish brown apically.

¹ Received on December 12, 2007. Accepted on February 5, 2008.

² Key Laboratory of Plant Protection Resources and Pest Management. Ministry of Education; Entomological Museum, Northwest A & F University, Yangling, Shaanxi 712100 China. E-mails: huabzh@nwsuaf.edu.cn (corresponding author), tanjiangli@sina.com, respectively.

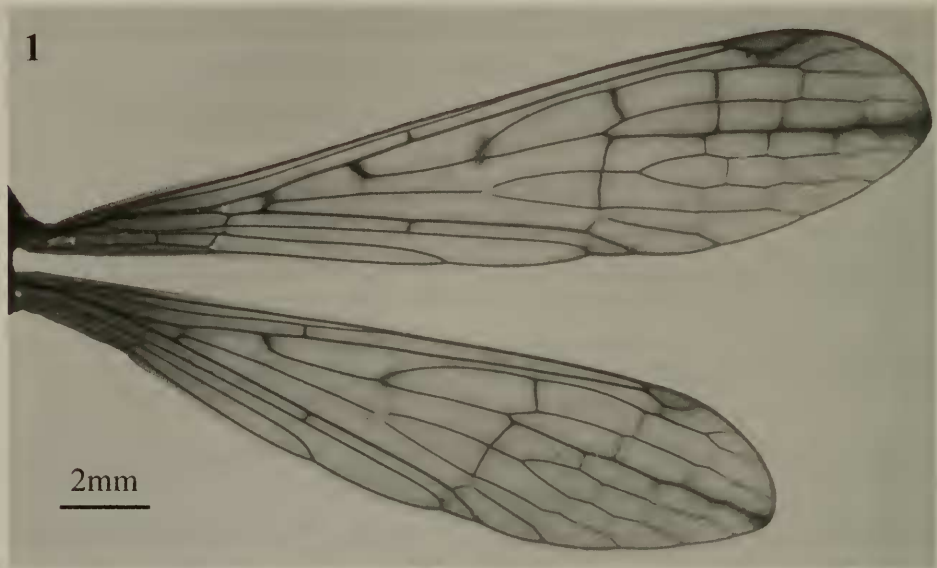


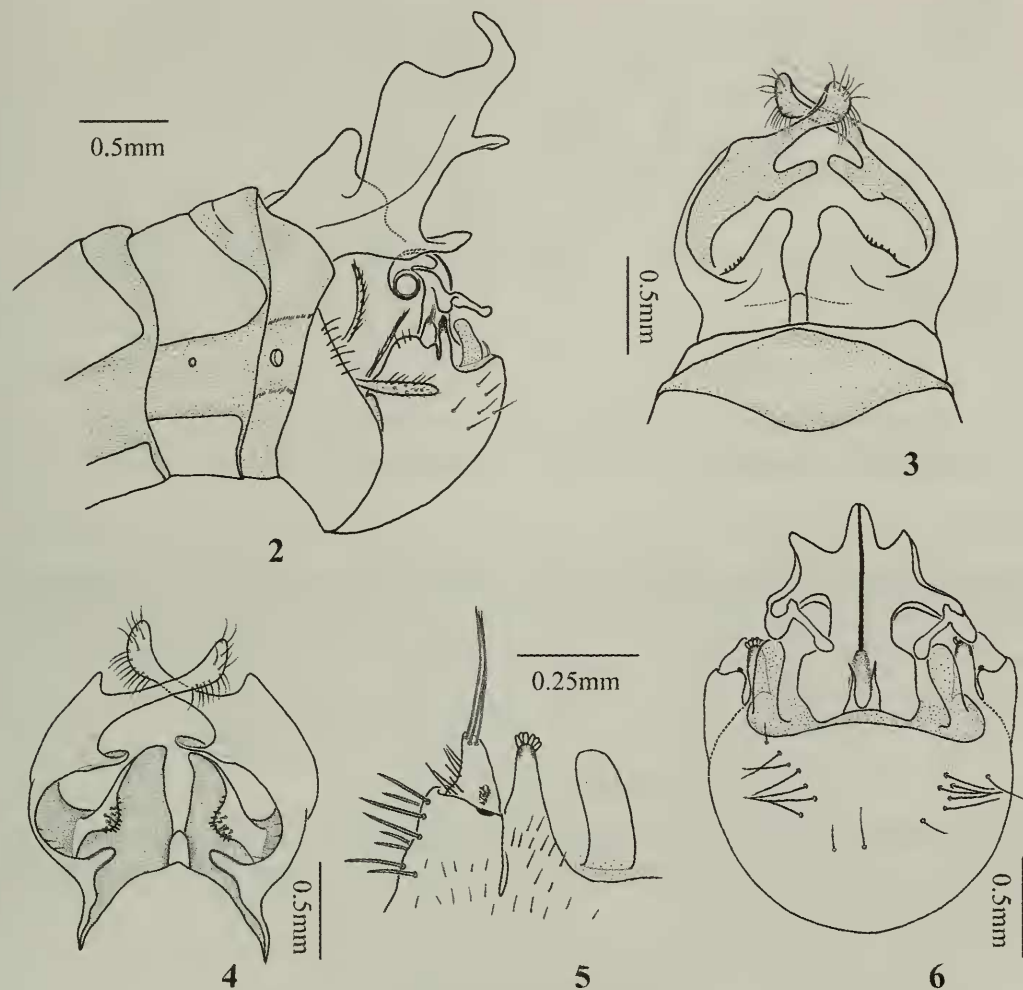
Fig. 1. Wings of *Bittacus hainanicus* Hua et Tan, sp. n.

Wings (Fig. 1). Forewing 20 mm long, 4.0 mm wide. Wings membrane hyaline with yellow tinge. Pterostigma prominent with a pterostigmal cross-vein (Pcv); two pale brown nygmata each present on cells R_{4+5} and $1R_5$; a large thyridium at first fork of media (FM), and a small thyridium at base of M_4 . Three distinct dark brown clouding flecks at origin of radial sector (ORs), first fork of radial sector (FRs), and origin of media from cubitus (OM), respectively; a noticeable cuneiform clouding along the whole length of vein R_5 , increasingly widened toward apex. Vein 1A terminating a little before FM; cubical cross-vein (Cuv) before FM; no anal cross-vein.

Hindwing 17 mm long, 3.5 mm wide; similar to forewings.

Abdomen of male: General coloration light brown, darkened at segmental junctions by strong sclerotization of acrotergites. The posterior margins of terga 7 and 8 deeply concaved in V-shaped; intersegmental membrane extending and covering the posterior mid-margin of tergum 8. Epiandrial appendages (tergum 9) highly modified; complicated by a subtriangular main lobe, whose posterior margin and an oval ventral process bearing numerous small black spines, and a lateral complex prolongation, whose basal two-third broad with two large ventral processes, while the apical one-third turning slender, extending caudo-dorsad with long setae along its apical ventral margin and on its tip (Figs. 2-4). Tergum 10 very narrow, sub-quadrangle in shape, hidden in the cavity surrounded by tergum 9 and genitalia, invisible from outside. Upper and lower branches of proctiger setiferous, short, and rather slender; not protruding between bases of epiandrial appendages. Cerci short, club-shaped. Gonocoxite brown, shorter than epiandrial appendage; deeply inclined dorsocephalad; middle of its posterior margin round; two processes each terminating with a cluster of small tubercles near the base of gonostyle. A small translucent linguiform membranous sheet borne on the membranous area between base of aedeagus and distal margin of gonocoxite, just next to each process. Gono-

style small, broad and thick basally bearing sparse short brown hairs; gradually tapering towards apex, with three long yellow setae (Fig. 5). The base of aedeagus broad, with two small processes on posterior margin; aedeagal lobes broad; near apex a long arm extending latero-caudad; turning slender at its midway. Penisfilum coiled into a rather small ring (Fig. 6).



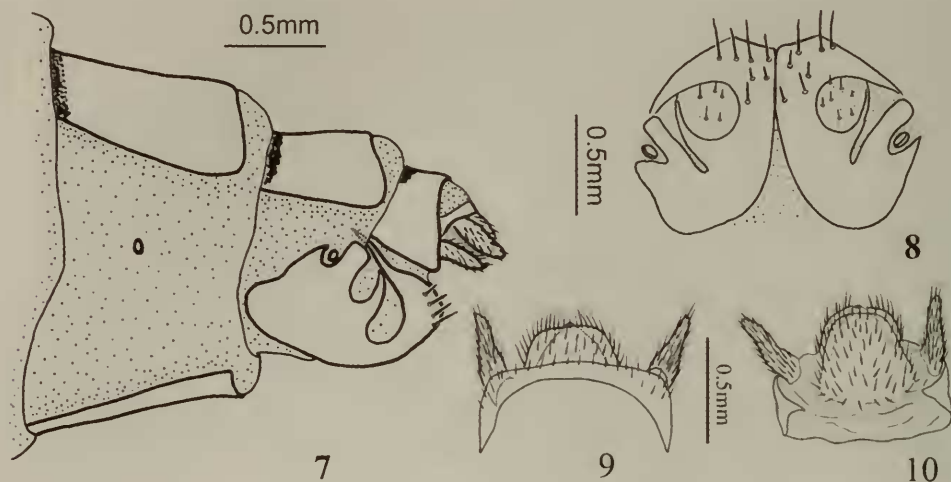
Figs. 2-6. Male of *Bittacus hainanicus* sp.n. 2, terminalia, lateral view; 3, epiandrial appendages, dorsal view; 4, same, ventral view; 5, gonostyle and apical part of gonocoxite, showing the process of gonocoxite and membranous sheet; 6, genitalia, ventrocaudal view.

Abdomen of female (Figs 7-10): Tergum 9 with a broad but short black trace of antecosta. Subgenitale dark brown, proximally oval in lateral view, with the dorsal margin deeply concave; the two halves separated to the very apex by a very narrow suture; a number of black stiff setae present. Tergum 10 brown, narrow, extending a little ventrad. Supraanale, subanale and cerci pale brown; supraanale narrow, with posterior margin roughly truncate; subanale longer than supraanale; Cerci of moderate length.

Etymology. The new species is named for its type locality, Hainan Island, China.

Type Data. **China: Hainan Island:** Holotype ♂, Bawangling (660 m), 109° 03'E, 19°10'N, 18.v.2007, coll. Li Yan-kai. Paratypes: 1♀, same data as holotype;

2♀♀, Wuzhishan (680 m), 109°38'E, 18°52'N, 9.v.2007, coll. Li Yan-kai and Zai Qing. Preserved in the Entomological Museum, Northwest A & F University.



Figs 7-10. Female of *Bittacus hainanicus* sp. n. 7, end of abdomen, lateral view; 8, sub-genitale, ventral view; 9, segment X, dorsal view; 10, same, ventral view.

Remarks. This species is unique by its gonocoxites highly inclined dorso-cephalad, with two processes near each base of gonostyle, and two additional membranous sheets near the base of aedeagus. Proctiger not protruding between bases of epiandrial appendages was first report among all its Chinese congeners. But the other characters fit *Bittacus* very well, especially the wing venations.

ACKNOWLEDGEMENTS

This research was financially supported in part by the National Natural Science Foundation of China (no. 30370179) and Biological Resource Expedition (Insect Group) to Hainan Island and Xisha Islets, Ministry of Science and Technology.

LITERATURE CITED

- Cai, L. J., P. Y. Huang, and B. Z. Hua. 2006. Two new Chinese *Bittacus* Latreille (Mecoptera: Bittacidae) from Michangshan Mountains. *Entomotaxonomia* 28(2): 127-130.
- Cheng, F. Y. 1957. Revision of the Chinese Mecoptera. *Bulletin of the Museum of Comparative Zoology* 116: 1-118.
- Esben-Petersen, P. 1927. New and little-known species of Mecoptera and Neuroptera in the Zoological Museum of Helsingfors. *Notulae Entomologicae* 7: 13-18.
- Hua, B. Z. and I. Chou. 1998. The Bittacidae of Funiu Mountain in Henan (Mecoptera). In, Shen, X-C and Shi, Z-Y (Editors), *Insects of the Funiu Mountains Region* (1): 64-67.
- Hua, B. Z. and J. L. Tan. 2007. A new species of *Bittacus* Latreille (Mecoptera, Bittacidae) from Daba Mountain in China. *Acta Zootaxonomica Sinica* 32: 455-458.
- Huang, P. Y. and B. Z. Hua. 2005. Four new species of the Chinese *Bittacus* Latreille (Mecoptera, Bittacidae). *Acta Zootaxonomica Sinica* 30(2): 393-398.
- Penny, N. D. and G. W. Byers. 1979. A checklist of the Mecoptera of the world. *Acta Amazonica* 9(2): 365-388.